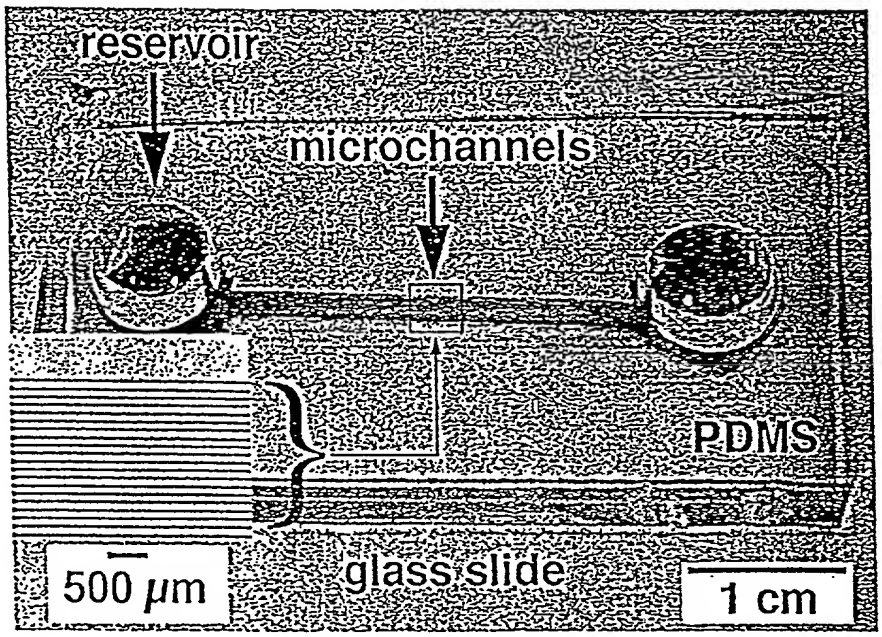


FIG. 1

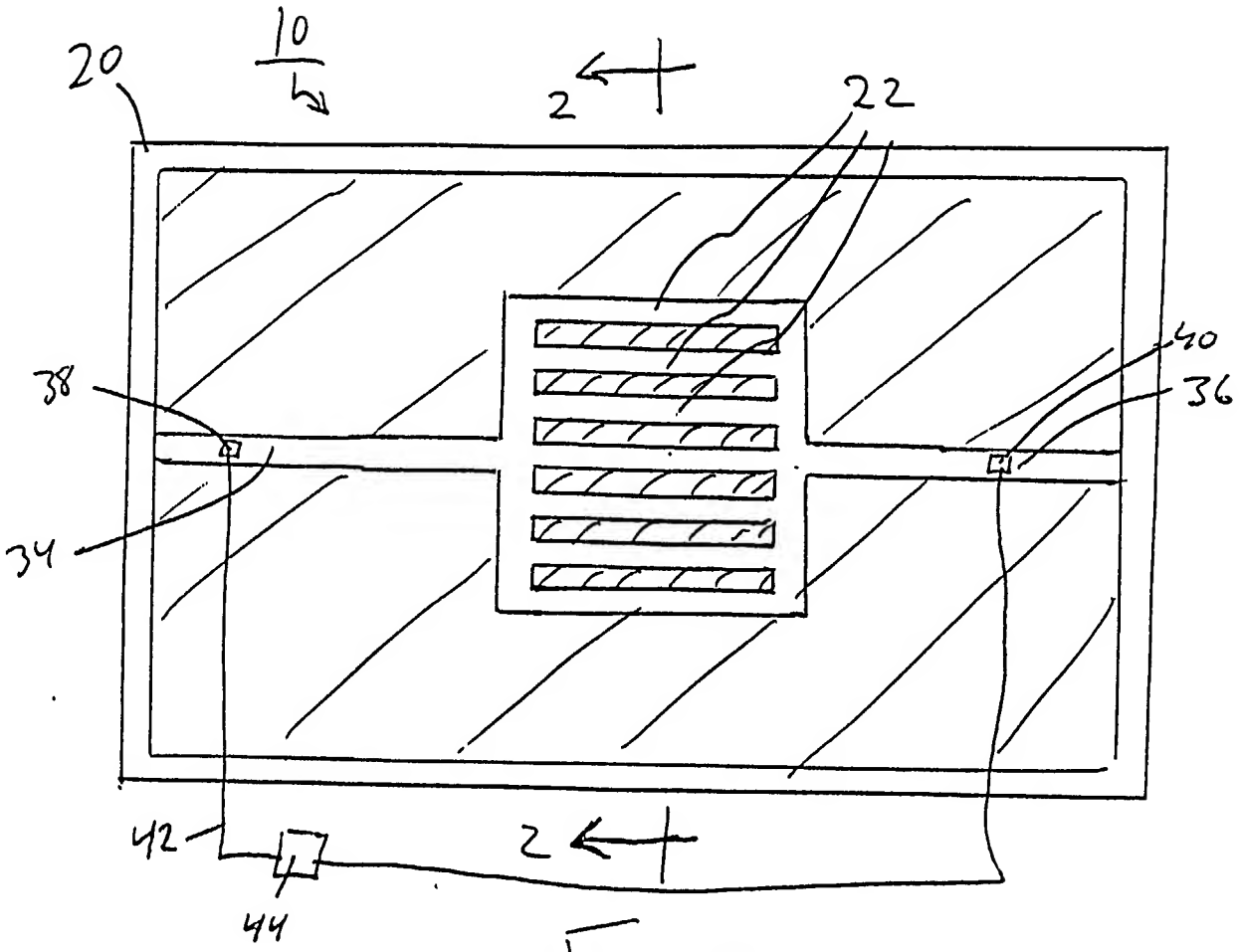


FIG. 2A

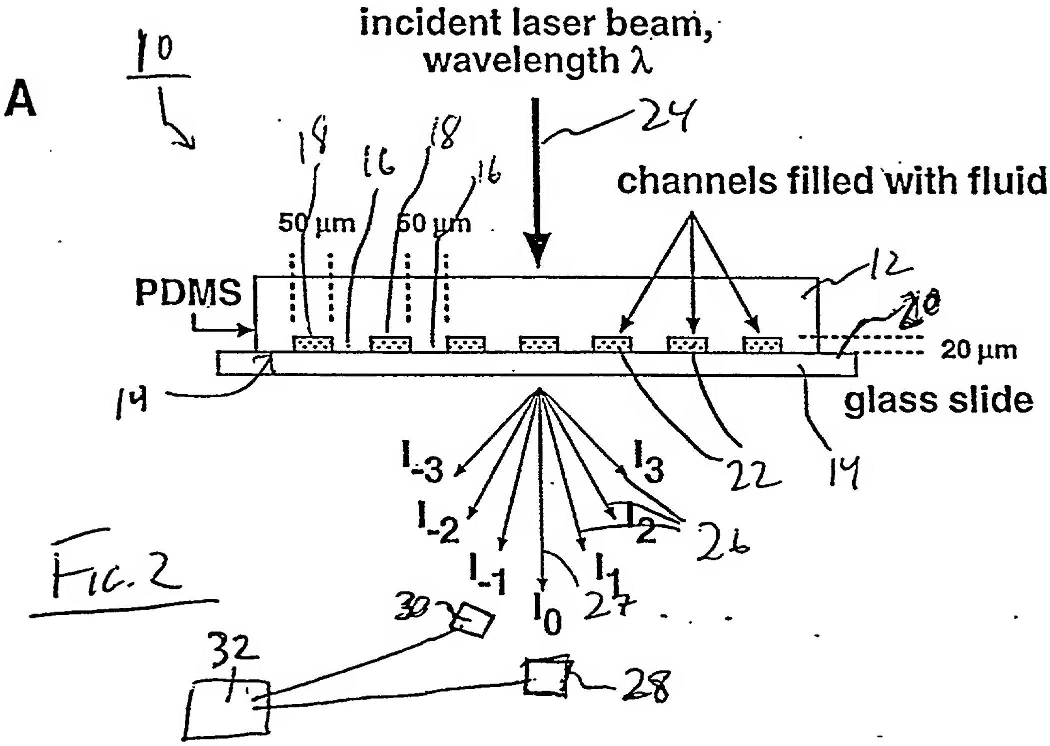
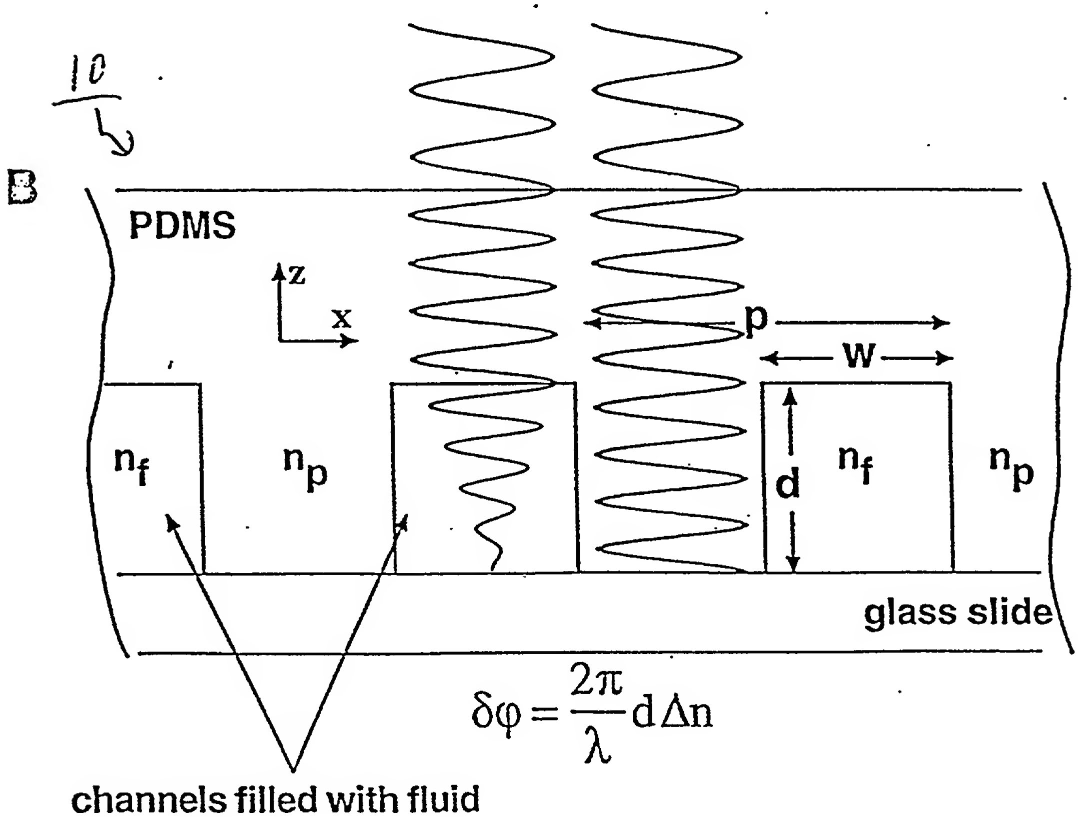


Fig. 2



$$\delta\varphi = \frac{2\pi}{\lambda} d\,\Delta n$$

Fig. 3

A

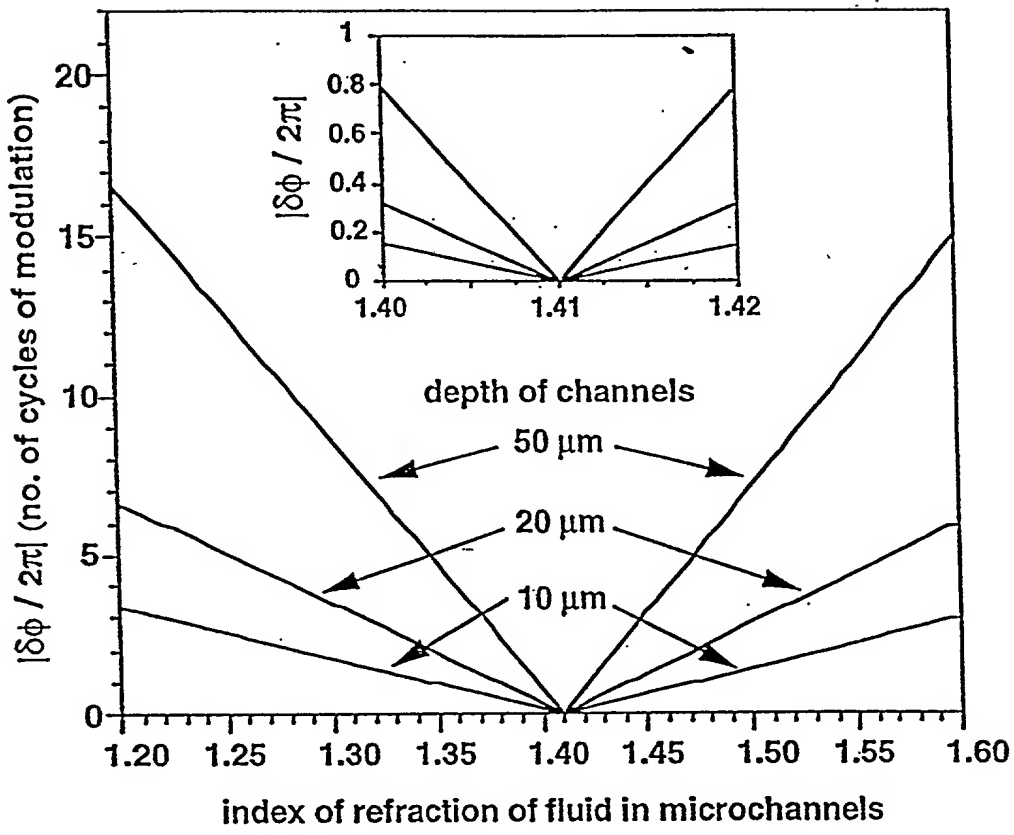

|δφ / 2π| (no. of cycles of modulation)
index of refraction of fluid in microchannels
depth of channels
50 μm
20 μm
10 μm
|δφ / 2π|

FIG 4

B

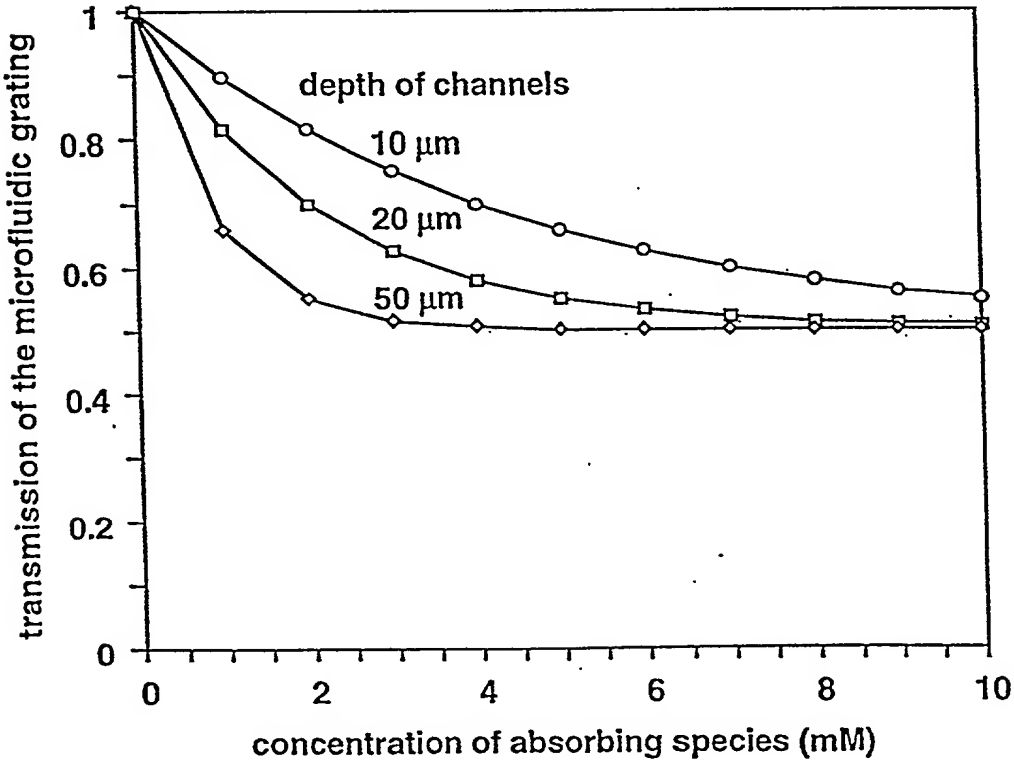

transmission of the microfluidic grating
concentration of absorbing species (mM)
depth of channels
10 μm
20 μm
50 μm

FIG 5

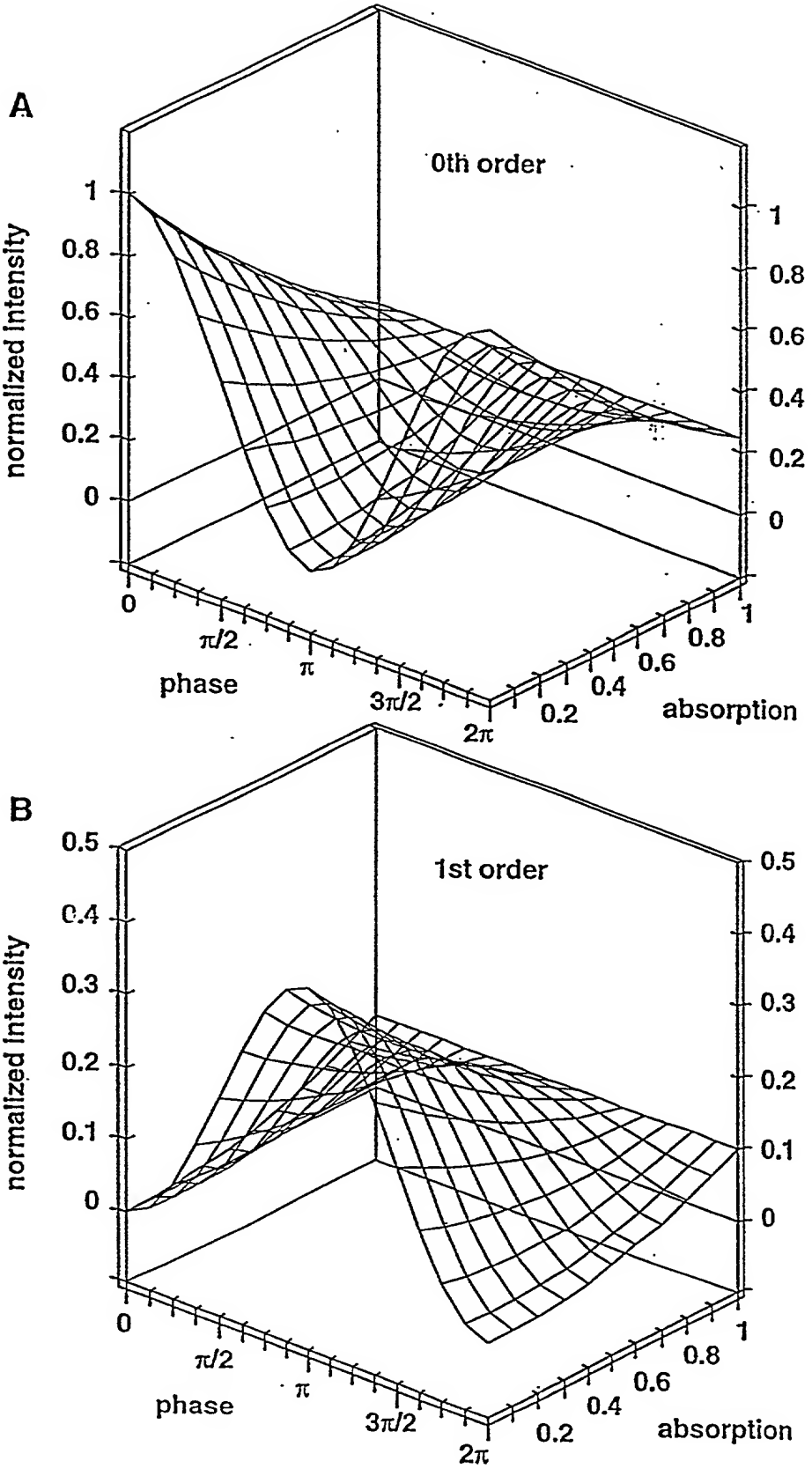


Fig. 6

Fig. 7

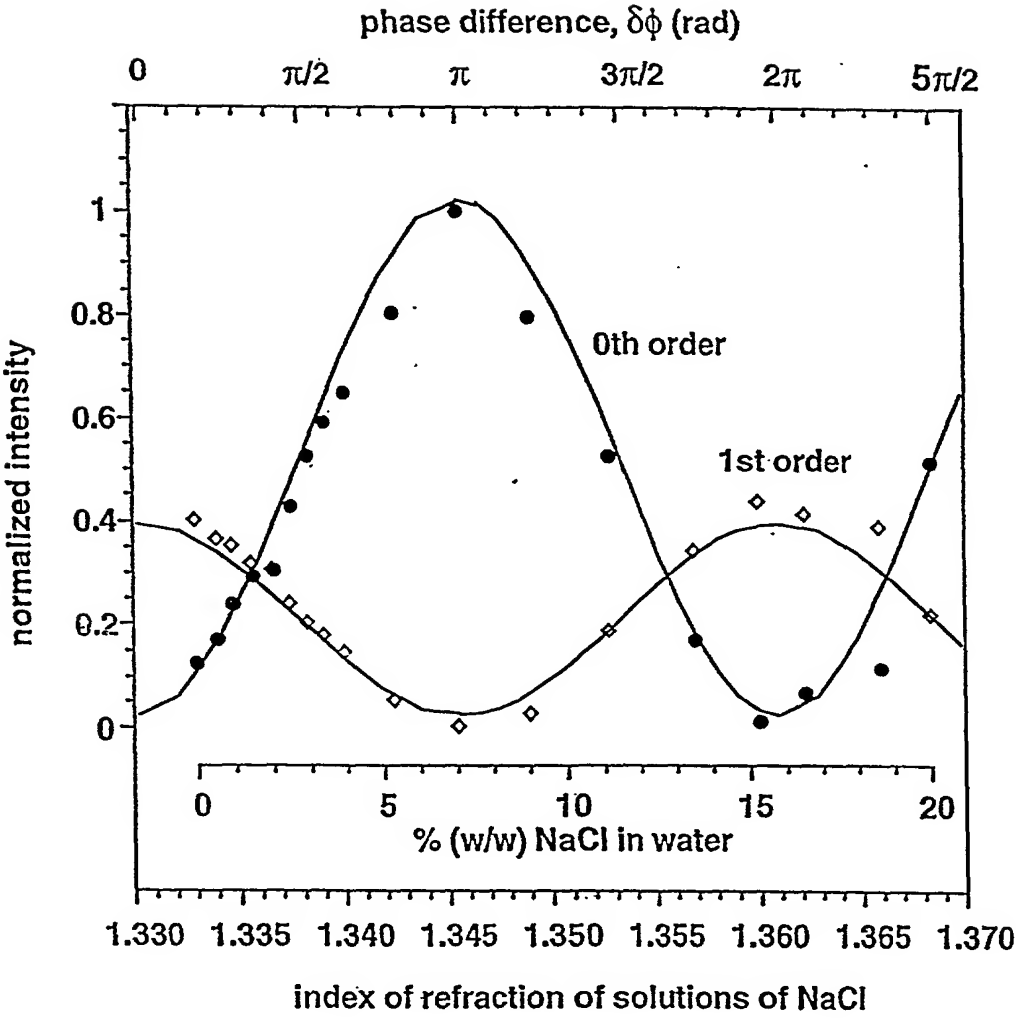

phase difference, δϕ (rad)
0
π/2
π
3π/2
2π
5π/2
normalized intensity
1
0.8
0.6
0.4
0.2
0
0th order
1st order
0
5
10
15
20
% (w/w) NaCl in water
1.330
1.335
1.340
1.345
1.350
1.355
1.360
1.365
1.370
index of refraction of solutions of NaCl

Fig. 8

FIG. 9

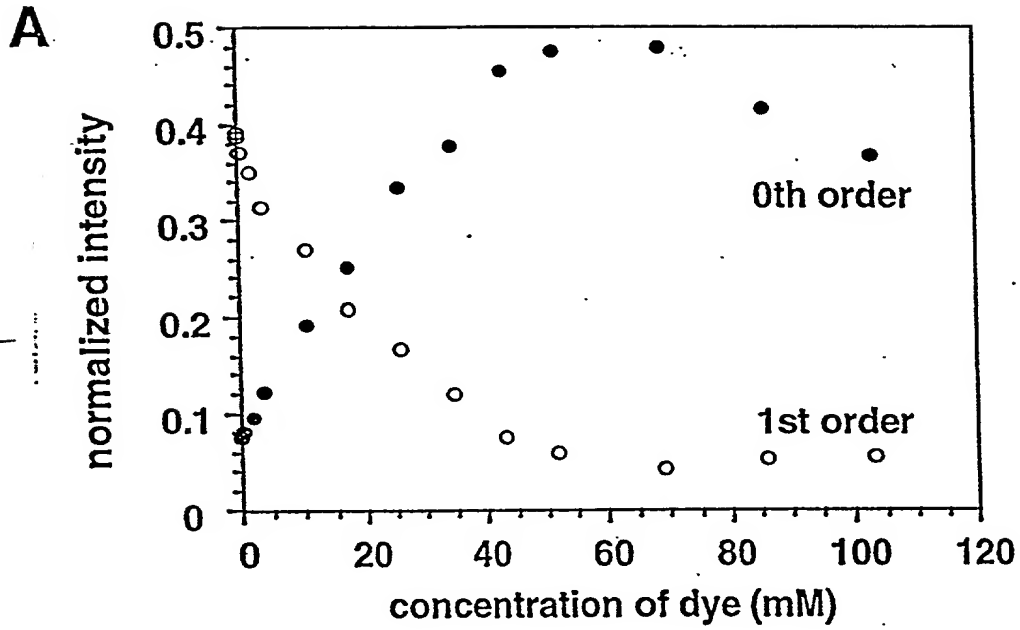
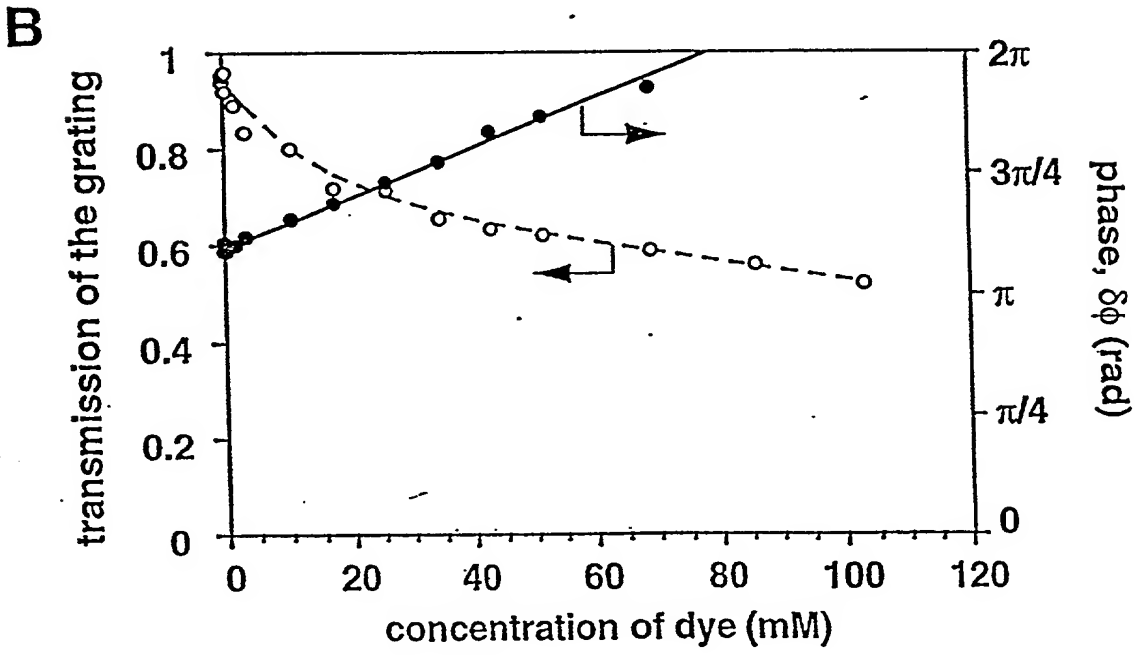

A
normalized intensity
0.5
0.4
0.3
0.2
0.1
0
0th order
1st order
0
20
40
60
80
100
120
concentration of dye (mM)

FIG. 10


B
transmission of the grating
1
0.8
0.6
0.4
0.2
0
2π
3π/4
π
π/4
0
phase, δφ (rad)
0
20
40
60
80
100
120
concentration of dye (mM)

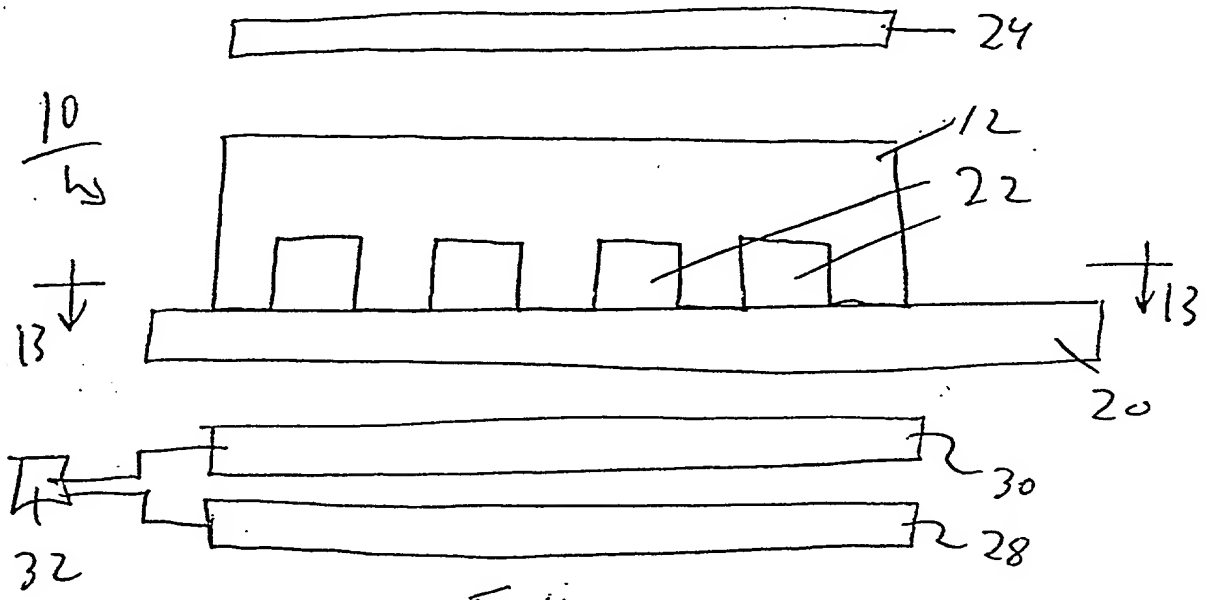


FIG. 11

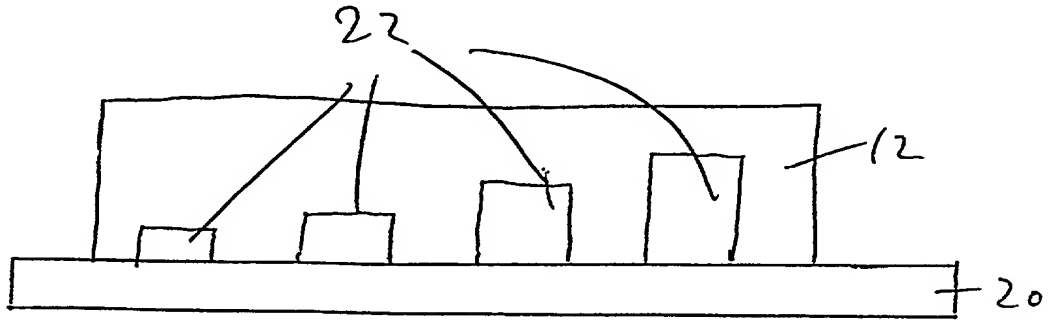


FIG. 12

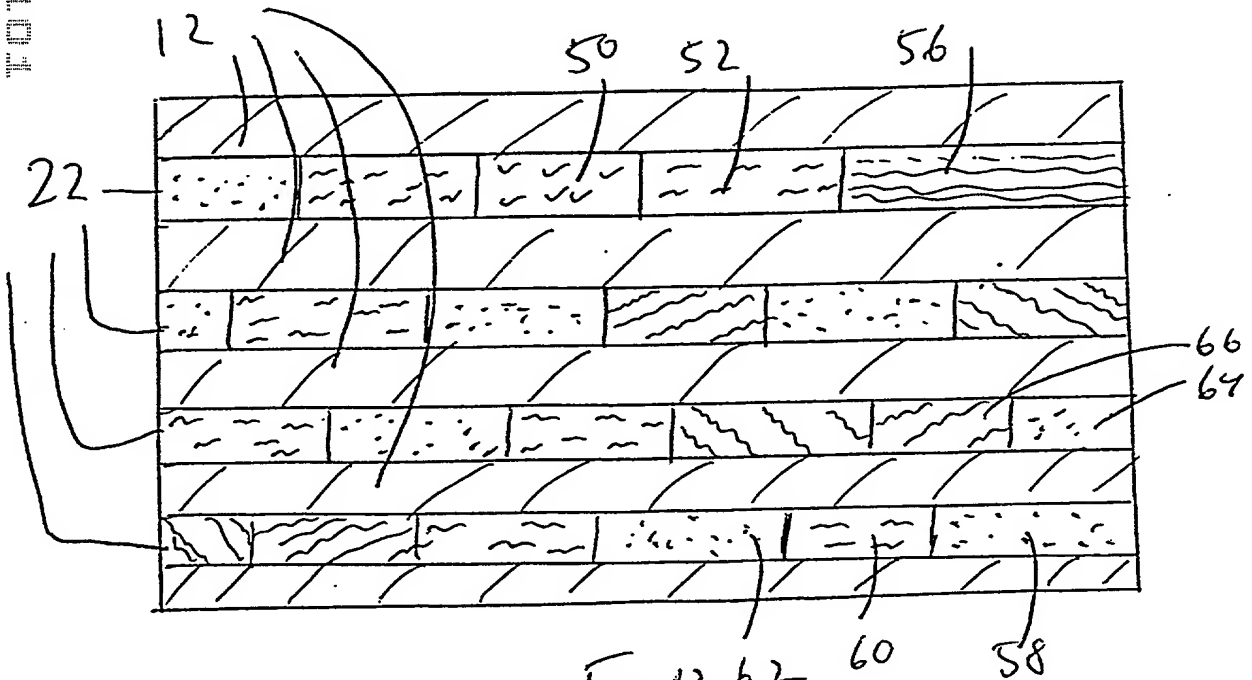


FIG. 13